UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
ZAND, KAMBIZ

ART UNIT	PAPER NUMBER
2132	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 February 2001</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-36</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-21 and 25-36</u> is/are rejected.

7)☒ Claim(s) <u>22-24</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>05 February 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>4,5</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   **Claims 1-36** have been examined.

Information Disclosure Statement PTO-1449

2.   The Information Disclosure Statement submitted by applicant on 10/05/2001 and

02/11/2002 (paper number 4, 5) has been considered. Please see attached PTO-1449.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4.   .**Claims 1-16** are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

In claims 1-36, the "QUANTITY OF DATA" phrases make the claims indefinite and

unclear because of relativity of the term. Examiner considers " a predetermined set of

data volume" as corresponding to the above term for the purpose of examination.

Appropriate corrections or clarification is requested.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6.   **Claims 1-4, 6-13, 17-21, 25, 28-36** are rejected under 35 U.S.C. 102(e) as being

anticipated by Sicola (6,643,795 B1).

As per claim 1 Sicola (6,643,795 B1) teach a data storage system comprising: a

plurality of storage nodes; data storage mechanisms implemented in each storage

node; a communication medium linking storage nodes; and a data distributed across a

selected set of the storage nodes such that the data remains available irrespective of

the unavailability of one or more of the storage nodes within the selected set (see

abstract; fig.2, 14 and 15 and associated text;col.3, lines 16-54 where data remains

available regardless of failure or unavailability of a storage node).

As per claim 2 Sicola (6,643,795 B1) teach the data storage system of claim 1 wherein

the data storage mechanisms on at least two storage nodes collectively implement a

unitary volume of network storage (see col.3, lines 56-60).

As per claim 3 Sicola (6,643,795 B1) teach the data storage system of claim 1 wherein

the communication medium comprises: a public network for receiving access requests

for the data storage system; and a private network enabling communication between

storage nodes (see col.4, lines 23-32).

As per claim 4 Sicola (6,643,795 B1) teach the data storage system of claim 3 wherein

the public network comprises the Internet (see col.4, lines 28-32).

As per claim 6 Sicola (6,643,795 B1) teach the data storage system of claim 1 further

comprising: communication processes implemented within each of the storage nodes

operable to exchange state information between at least some of the other data storage

nodes (see fig.6-7 and associated text).

As per claim 7 Sicola (6,643,795 B1) teach the data storage system of claim 1 wherein

each of the data storage nodes further comprises data structures configured to store

state information about one or more other nodes and the communication links between

them (see fig.13 and associated text).

As per claim 8 Sicola (6,643,795 B1) teach the data storage system of claim 7 wherein

the state information comprises information selected from the group consisting of but

not limited to: availability information, capacity information, quality of service

information, performance information, geographical location information, network

topological location information (see col.17, lines 1-30).

As per claim 9 Sicola (6,643,795 B1) teach the data storage system of claim 8 wherein

the set of storage nodes is selected by a first of the storage nodes using the state

information stored in the first of the storage nodes (see col.6-7 and as applied to claim 8

above).

As per claim 11 Sicola (6,643,795 B1) teach the data storage system of claim 1

wherein the network comprises: a plurality of first level networks, each first level network

coupling multiple storage nodes; and a second level network coupling at least two of the

first level networks (see fig.2 and 4 and associated text).

As per claim 12 Sicola (6,643,795 B1) teach the data storage system of claim 11

wherein the first level network comprises a connection selected from the group

consisting of: Ethernet, fast Ethernet, gigabit Ethernet, Fibre channel, ATM, firewire,

Myernet, SCSI, serial, parallel, universal serial bus, and wireless networks (see col.4,

lines 27-31).

As per claim 13 Sicola (6,643,795 B1) teach the data storage system of claim 1 further

comprising: storage management processes executing on one of the storage nodes to

determine state information about each of the set of storage nodes (see fig.13 and

associates text; col.17).

As per claim 17 Sicola (6,643,795 B1) teach a method of managing data storage in a

network comprising multiple storage nodes, the method comprising the acts of:

communicating a storage request to at least one storage node; and causing the at least

one storage node to implement the storage request using an arbitrary subset of the

storage nodes (see abstract; fig.2, 14 and 15 and associated text;col.3, lines 16-54

where data remains available regardless of failure or unavailability of a storage node).

As per claim 18 Sicola (6,643,795 B1) teach the method of claim 17 further comprising:

communicating state information between the multiple storage nodes; and selecting the

arbitrary subset of the multiple storage nodes to be used based upon the state

information (see fig.2 and 4 and associated text).

As per claim 19 Sicola (6,643,795 B1) teach the method of claim 17 wherein the act of

implementing the storage request comprises associating error checking and correcting

(ECC) code with storage request (see fig.5, 9 and associated text).

As per claim 20 Sicola (6,643,795 B1) teach the method of claim 19 wherein the ECC

code is stored in a single network storage node and the unit of data is stored in two or

more network storage nodes (see fig.5, 9 and associated text).

As per claim 21 Sicola (6,643,795 B1) teach the method of claim 17 further comprising:

retrieving a stored unit of data specified by the storage request; and verifying the

correctness of the stored unit of data; upon detection of an error in the retrieved unit of

data, retrieving the correct unit of data using data stored in the others of the arbitrary

subset of the multiple storage nodes (see col.3, lines 16-67; col.4; col.5, lines 1-15;

fig.5, 9 and associated text).

As per claim 25 Sicola (6,643,795 B1) teach the method of claim 17 further comprising

moving the stored unit of data from one network storage node to another network

storage node after the step of storing (see abstract; col.3 line 16 to col.5 line 15).

As per claim 28 Sicola (6,643,795 B1) teach a data storage system comprising: a peer-

to-peer network of storage devices, each storage device having means for

communicating state information with other storage devices, at least one storage device

comprising means for receiving storage requests from external entities, and at least one

storage device comprising means for causing read and write operations to be performed

on others of the storage devices (see abstract; fig.2, 14 and 15 and associated

text;col.3, lines 16-54 where data remains available regardless of failure or unavailability

of a storage node).

As per claim 29 Sicola (6,643,795 B1) teach the system of claim 28 wherein each of

the storage devices comprises means for causing read and write operations to be

performed on others of the storage devices (see fig.1-3 and associated text).

As per claim 30 Sicola (6,643,795 B1) teach the system of claim 28 wherein each of

the storage devices comprises data structures defined to configure at least two

geographically distant ones of the data storage devices as a unitary volume of storage

(see col.6, lines 63-67 and col.7, lines 1-16 where remote corresponds to applicant's

geographically distance).

As per claim 31 Sicola (6,643,795 B1) teach the system of claim 30 further comprising:

a network coupling to each of the data storage devices; and a storage controller

coupled to the network for logically combining the at least two data storage devices into

a single logical storage device (see col.7, lines 17-47 and as applied to claim 30 above).

As per claim 32 Sicola (6,643,795 B1) teach a distributed data storage array

comprising: a plurality of network connected storage nodes; a network interface within

each storage node for receiving data and control information from other storage nodes;

a network interface within at least one storage node for receiving data storage access

requests from external sources; and storage management processes within the at least

one storage node operable to distribute data storage for a logically contiguous quantity

of data across multiple storage nodes (see abstract; fig.2, 14 and 15 and associated

text;col.3, lines 16-54 where data remains available regardless of failure or unavailability of a storage node).

As per claim 33 Sicola (6,643,795 B1) teach a data storage system implemented on top of a plurality of networked computer systems and a communication network, wherein each of the networked computer systems implements a storage node and comprises: a processor for processing data according to program instructions; a network interface coupled to the processor and the network for communicating data with external entities, including other storage nodes, across the network; memory coupled to the processor, the memory comprising storage space configured to store data and instructions used by the processor; one or more mass storage devices coupled to the processor; a communication process comprising program instructions executing in the storage node and in communication with the network interface to provide an interface to communicate data storage access requests and responses with the external entities; storage management processes comprising program instructions executing in the storage node and responsive to the received data storage access requests and in communication with the network interface to distribute and coordinate data storage operations with external storage nodes (see abstract; fig.2, 14 and 15 and associated text;col.3, lines 16-54 where data remains available regardless of failure or unavailability of a storage node).

As per claim 34 Sicola (6,643,795 B1) teach the system of claim 33 wherein the

storage management processes include processes that communicate with the external

storage nodes to provide fault-tolerant distribution of data across the a plurality of

storage nodes col.6, lines 63-67 and col.17, lines 1-17).

As per claim 35 Sicola (6,643,795 B1) teach the system of claim 33 wherein the

storage management processes include processes for distributing data redundantly to

protect against faults that make one or more storage nodes unavailable (see abstract;

col.3, lines 16-67; col.4 and col.5, lines 1-14).

As per claim 36 Sicola (6,643,795 B1) teach the system of claim 33 wherein the

storage management processes includes fault recovery processes, wherein the fault

recovery processes respond to a fault condition by communicating with at least one of

the external storage nodes to make available a set of data that would otherwise be

unavailable as a result of the fault condition (see fig.5, 9 and associated text; col.3, lines

45-55).

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) patent may not be obtained though the invention is not identically disclose or described as set forth
> in section 102 of this title, if the differences between the subject matter sought to be patented and the
> prior art are such that the subject matter as a whole would have been obvious at the time the invention
> was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   **Claims 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sicola
(6,643,795 B1) in view of Laursen et al (5,805,804 A).

As per claim 5 Sicola (6,643,795 B1) teach the data storage system having a private
network having IP (internet capabilities) as applied to claim 1, 3 and 4 above but do not
disclose wherein the private network comprises a virtual private network implemented
over the Internet. However Laursen et al (5,805,804 A) disclose a virtual private
network implemented over the Internet (see fig.2 and associated text). It would have
been obvious to one of ordinary skilled in the art at the time the invention was made to
utilize Laursen's virtual private network over internet in Sicola's storage site failover
capability in order to provide a distributed client-server computing and access to the
data over asymmetric real-time networks.

9.   **Claims 14-16 and 26-27** are rejected under 35 U.S.C. 103(a) as being
unpatentable over Sicola (6,643,795 B1) in view of Dugan et al (6,779,030 B1).

As per claims 14-16 and 26-27 Sicola (6,643,795 B1) teach the data storage system of
claim 1 as applied above but do not disclose explicitly wherein the communication
medium comprises a secure communication medium, implementing an authentication
protocol between linked storage nodes and cryptographic security between linked
storage nodes. However Dugan et al (6,779,030 B1) disclose wherein the

communication medium comprises a secure communication medium (see col.64, lines 54-60), implementing an authentication protocol between linked storage nodes and cryptographic security between linked storage nodes (see col.74, lines 31-35). It would have been obvious to one of ordinary skilled in the art at the time the invention was made to utilize Dugan's secure cryptographic process in Scicola's storage system in order to provide content privacy such as voice privacy (see col.74, line 33-34).

Allowable Subject Matter

10.   **Claim 22-24** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11.   **Claim 10** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

        U.S.Patent No. US (6,754,181 B1) teach system and method for a directory service supporting a hybrid communication system architecture.

U.S.Patent No. US (6,654,831 B1) teach using multiple controllers together to

create data spans.

U.S.Patent No. US (5,870,474 A) teach method and apparatus for providing

conditional access in connection-oriented, interactive networks with a multiplicity

of service providers.

U.S.Patent No. US (6,065,008 A) teach system and method for secure font

subset distribution.

U.S.Patent No. US (6,393,473 B1) teach representing and verifying network

management policies using collective constrains.

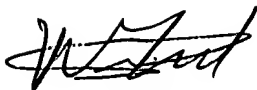U.S.Patent No. US (6,760,330 B2) teach community separation control in a multi-

community node.

U.S.Patent No. US (5,689,678 A) teach distributed storage array system having a

plurality of modular controllers.

U.S.Patent No. US (6,839,827 B1) teach method, system, program, and data

structures for mapping logical blocks to physical blocks.

13. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Kambiz Zand whose telephone number is (703)

306-4169. The examiner can normally reached on Monday-Thursday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Gilberto Barron can be reached on (703) 305-1830. The fax phone

numbers for the organization where this application or proceeding is assigned as

(703) 872-9306. Information regarding the status of an application may be

obtained from the Patent Application Information Retrieval (PAIR) system. Status

information for published applications may be obtained from either Private PAIR

or Public PAIR. Status information for unpublished applications is available

through Private PAIR only. For more information about the PAIR system, see

http://pair-direct.uspto.gov. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free).

Kambiz Zand

02/18/05